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THE ROE-DEER, *CAPREOLUS CAPREA*.

BY THE EDITOR.

(PLATE I.)

THE presence in so many English Parks of herds of Fallow-deer, and in smaller numbers of Red-deer, has rendered the appearance of these two species tolerably familiar to most people, while the Red-deer, still a "beast of chace," is hunted with stag-hounds in England and Ireland, or falls to the rifle of the deer-stalker in Scotland. It is otherwise with the Roe-deer, whose appearance is less familiar, because the animal—in England, at all events—is much less common, while in Ireland it is quite unknown. It is curious that it should be so, for the Roe, like the Red-deer, is an indigenous British animal, while the Fallow has been introduced. The explanation, however, is to be found in the fact that while the Fallow-deer has been protected in parks, where it is fed during the winter, and prevented by fences from straying away, the Roe has been suffered to take its chance, and has met with the fate which would naturally overtake any game animal of its conspicuous size and wandering disposition.

There was a time when it must have been common in all our English wood-lands, for there is abundant evidence, both geological and historical, to show that it existed in widely separated localities in many different counties. Amongst these may be mentioned Northumberland, Cumberland (whence Charles I. stocked

the royal park at Wimbledon*), Durham, Yorkshire, Lancashire, Leicestershire, Norfolk, Suffolk, Cambridgeshire, Hants, Dorset, and Devon, not omitting Wales, where it was to be found in the time of Queen Elizabeth. The evidence of its former existence in these places has been so fully detailed elsewhere,† that it is unnecessary here to repeat it. Suffice it to say that, with the exception of Cumberland, where a limited number are established near Wigton (Zool. 1887, pp. 382, 383), Dorsetshire (Zool. 1879, pp. 120, 170, 209, 262, 301), and Essex (where it was re-introduced in 1884, after having been extinct for many years), and certain parks, such as Windsor and Petworth, where a few have been turned down, the Roe can now only be looked for in any numbers beyond the Scottish borders. There it still roams in many a covert sufficiently remote from human habitation, and there we have had the pleasure of observing it in all its pride of unrestrained freedom; now jumping up suddenly from some bed of fern in which it had been lying concealed; now stealing away, like a shadow before the shooters, or when driven by advancing "beaters," coming with a rush to its doom through some accustomed pass. In Dorsetshire, too, when pheasant-shooting, it has been our good fortune to see sometimes as many as twenty or more in a day, of which three or four, perhaps, at intervals, would fall to a charge of No. 5 shot at close quarters, making a pleasing variety and weighty addition to the game-bag. On such occasions it was astonishing to see the almost impenetrable covert through which a Roe would dash at full speed without any apparent harm, although one would suppose that its large and prominent eyes could scarcely escape serious injury from the opposing twigs and thorns which barred its way.

"It is a rare thing," says Colquhoun, in 'The Moor and the Loch,' "to take a right and left at Roe; they slip past so quickly, and generally in small numbers. I have known many old sportsmen who have shot them all their lives, and yet never killed a couple right and left. During my whole shooting life I have only

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* *Cf.* Harting, 'Essays on Sport and Natural History,' pp. 47, 48.

† "On the former Existence of the Roe-deer in England," Harting, 'Essays on Sport and Natural History,' pp. 38—55. The Roe was at one time (1716) to be found in the Channel Islands on the island of Herm (Zool. 1880, p. 399), but probably only as an introduced species.

done so five times, and yet few men have slain more Roes." Charles St. John has truly said ('Sport in Moray,' p. 34) that no man with any feeling can kill a Roe without a pang of regret; and yet his natural instinct as an animal of prey will lead him on to hunt and kill another Roe an hour afterwards!

The Roe was introduced into Dorsetshire at the beginning of the present century by the then owner of Milton Abbey, who kept some in a large walled-in park which he made there. After they had increased rapidly, his neighbour Mr. Drax begged some, and turned them out in Vere Wood, which was then fenced in by a park-paling. Here they also went on increasing; the paling fell out of repair, and the deer wandered and spread over the country. In 1879 Mr. Mansel-Pleydell estimated that there were about 120 head, and in 1884 about 150 head, in the Milton, Whatcombe, and Houghton Woods, which fringe the southern side of the Vale of Blackmoor, from Stoke Wake to Melcombe Park, and the Grange Wood westward, the number being merely a question of preservation or non-preservation by adjoining land-owners. It is said that Lord Portman, in the interest of fox-hunters, gives a reward for every Roe killed in his coverts, to prevent his hounds from following their scent, as they will do, in preference to that of fox.

From the centre of distribution above mentioned the Roe-deer sometimes wander to a considerable distance, but generally get killed before they succeed in establishing themselves in a new locality. In 1883 a buck was found in Somersetshire, and hunted by the Seavington Hounds, who came upon him in the chain of large coverts lying to the south of the Vale of Taunton. They ran him eight miles with a burning scent, and killed him near Otterford. No doubt he had strayed from South Dorset-shire, perhaps from the Hook Park coverts on Lord Sandwich's property, which would be about twenty miles from the place where he was found.

It was in Dorsetshire, in the spring of 1884 that some Roe-deer were captured in the coverts of Mr. Mansel-Pleydell at Whatcombe and Houghton, and of Col. Hamboro at Milton, and transported by cart and rail into Essex, where they were liberated the next day in Epping Forest to re-stock the glades in which their species had formerly roamed, but where they had long been extinct. It was our privilege to take part in the capture, the

feasibility of which was doubted by many, and after travelling all night with them to save time, we had the pleasure of seeing them restored to liberty in a new country within twenty-four hours of securing the first one. As the *modus operandi* has been fully detailed elsewhere,* it is unnecessary to repeat a description of the hunt. Suffice it to say that in the following spring, through the exertions of Mr. E. N. Buxton, one of the Verderers of Epping Forest, a few more were obtained from Dorsetshire and turned out in the forest, where, being well looked after by the keepers, they have since roamed undisturbed, and have increased in number every year.

The keepers in Dorsetshire do not concur in the generally accepted belief that the Roe is monogamous, asserting that in the breeding season they have often seen a buck consorting with two and sometimes three does. This does not tally with the statements of foresters in Scotland and Germany, where the habits of the Roe-deer have been attentively studied, and may be an error of observation, the animals seen with the buck in the rutting-season being possibly a doe with a fawn, or fawns, which would not breed. The buck remains the winter through with the doe and fawns until he begins to change his grey winter coat, when he leaves her, and roams alone.

The does bring forth their young in April and May, generally two, male and female, very rarely three,† and these, like the young of other species of deer, are at first speckled with white. The white spots disappear in a few weeks, and the colour then resembles that of the parent. In the "bedding season," as it is termed, the doe retires to some quiet and secluded spot, and on the birth of the kids covers them over so carefully that they are very rarely found.

One of the brothers Stuart, who enjoyed such unrivalled opportunities for observing the habits of the wild animals of Scotland, thus graphically describes the bed of a Roe:—

"In the middle of the thicket there was a group of young trees growing out of a carpet of deep moss, which yielded like a down pillow.

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* 'The Field,' 5th April, 1884. See also 'Transactions of the Essex Field Club,' 1887, pp. 46—62.

† See 'The Field,' 2nd Sept. 1871.

The prints of the doe's slender forked feet were thickly tracked about the hollow, and in the centre there was a bed of the velvet 'fog,' which seemed a little higher than the rest, but so natural that it would not have been noticed by any unaccustomed eye. I carefully lifted the green cushion, and under its veil, rolled close together, the head of each resting on the flank of the other, nestled two beautiful little kids, their large velvet ears laid smooth on their dappled necks, their spotted sides sleek, and shining as satin, and their little delicate legs as slender as hazel-wands, shod with tiny glossy shoes, as smooth and black as ebony, while their large dark eyes looked at me out of the corners with a full, mild, quiet gaze which had not yet learned to fear the hand of man."

The affection of the doe for its young is very strong, and, timid and feeble as it is by nature, inspired by danger threatening its offspring it becomes brave and daring, and in their defence will attack not only animals but men. When quite young the kid, if alarmed, will crouch like a hare on the ground, laying down its ears on its spotted back.

One of the most singular points in the history of the Roe-deer is the abnormal gestation of the doe. It was well known to German foresters, to whom this animal is of course much more familiar than to keepers in this country, that the Roe-deer produced its fawns at the end of April or beginning of May, somewhat earlier than the fawns of the Red-deer and Fallow Deer are found,* and, although most people assumed that the rutting season was at the same time of year as with the larger *Cervidæ* (the Brothers Stuart, for example, were of this opinion, and even that great authority on woodcraft, Dietrich aus dem Winkell), German foresters asserted from observation that it was two months earlier, namely, in the month of August. If this were true, as it was proved to be by the late Dr. Ziegler, it seemed strange that the period of gestation should be two months longer than in the case of its larger relatives, and it was some time before the matter was explained. At length the researches of a well-known embryologist, Dr. Bischoff, Professor at the University of Munich, put the matter in a true light, and revealed a very curious and unexpected fact. From an examination of a considerable number of does shot at various intervals between the months of August and May, he discovered that although the pairing

* *Cf.* Harting, Proc. Zool. Soc. 1884, p. 152.

season, as already stated, is in August (sometimes at the end of July), the germ, or *ovum*, remains dormant, and of minute size, for about four months and a half, until December, when it suddenly begins to develope at the normal rate, the whole period of gestation being forty weeks.* Commenting upon this singular fact, Bell, in his 'History of British Quadrupeds' (2nd ed. p. 365), observes, "As far as we are aware no similar phenomena have been observed in any other quadruped, and it is difficult to conceive why this species should differ so markedly from others which are nearly allied to it both in organization and habits." Upon this we would remark that, having under consideration a great number of instances in which female Badgers, after having been kept in solitary confinement for periods as long as ten, eleven, twelve, and even thirteen months, have suddenly produced young, there is some reason to suspect that with this animal also there may be a period of "suspended gestation," and it would be well if some competent embryologist would institute as careful an enquiry in the case of the Badger as has been made by Prof. Bischoff in the case of the Roe.

The fawns follow their parents for about six months, and it is not until the following spring that the young bucks begin to get their horns. In their first year these are single straight tines; in the second year there are two tines, and in the third year three, after which no other tines are added, the horns merely increasing in size according to circumstances, the growth of the antlers depending in a great measure on the abundance or scarcity of good and nutritious food.

In no other Deer with which we are acquainted are the horns so liable to variation as in the Roe. A very large collection might be made in which no two heads would be found alike. Our readers may recollect that in 'The Zoologist' for 1884 (pp. 353, &c.) we described and figured some very remarkable Roe horns from a collection made in Germany, some of these being noticeable for their unusual length, or fantastic growth, and two in particular were figured as being probably unique of their kind. In one of these (Fig. 10) there are two pairs of horns growing on the same skull, as in the case of the Indian Four-horned Antelope (*Tetraceros*); and in another (Fig. 11) is seen a coalescence of

* Bischoff, 'Entwicklungsgeschichte des Rehes,' Giessen, 1854.

the burrs of what should have been two independent horns, and a union of the two beams in the centre of the forehead with a subsequent bifurcation and development of a single tine on each prong of the fork. By many sportsmen these abnormal horns are much valued and eagerly collected. The pages of the German sporting papers—such as the 'Illustrirte Zeitung' and 'Der Weidmann'—contain, in almost every issue during the shooting season, engravings from photographs of remarkable Roe heads.

Roes shed their horns from the beginning of December until January, and are then at their best. In February they begin to fall off in condition, and by the beginning of March they are useless as food until the following November. Bucks shot during the first week of December have had their horns so loose that they have fallen off on the way home. The time at which they lose the velvet from the new horns in the spring depends on the mildness or otherwise of the season, the bucks during a backward spring retaining it sometimes until the middle of April, while in early seasons the horns are quite clean by the beginning of that month.

Occasionally a female Roe with horns has been met with, but such instances are undoubtedly rare. One with budding horns was shot on October 26th, 1875, by Mr. Duncan Davidson, of Inchmarlo, Banchory, Aberdeenshire. The skull of another, procured from Petworth Park, Sussex, is figured in the 'Proceedings of the Zoological Society' (1879, p. 297), in illustration of some remarks on the subject by the late Edward Alston; and on January 5th, in that year, a third "in the velvet" was killed on the estate of Sir James Fergusson, Bart., of Kilkerran, Ayrshire, as reported in 'The Field' of the 18th of January, 1879. Two other instances noted in the Black Forest, at Kippenheim, are mentioned in 'The Zoologist' for 1886, p. 435.

The colour of the Roe varies with the season, being reddish brown in summer and grey in winter.* Until they exchange the red hair for the mouse-coloured, says Colquhoun (*op. cit.*), they

* It is noteworthy that all three species of British Deer are distinguished by names indicative of their colour, namely, Red, Fallow (cognate with the German, *falb*, yellow), and Roan.

are only bags of bones covered with dark dry flesh, without a particle of fat.

The summer coat begins to change for the winter one in September, being complete in November, before which time no Roes should be shot. Red-deer stags, on the contrary, never come into prime order until they are divested of the winter grey and have assumed the rich red of the sporting season.

When the woods are thick with leaves, it is very difficult to force a Roe into open ground at all; but instinct also warns it not to come into view when at its weakest state. Thus, whether for sport or food, the Roe should never be hunted except for the short time they are, or ought to be, in their prime; and if this rule be broken they will equally disappoint the shooter and the gourmand. An adult Roebuck will measure from twenty-five to thirty inches at the shoulder, and weigh from forty to fifty pounds. In Dorsetshire bucks killed in February, when in good condition, have been found to weigh as much as seventy pounds.

Occasionally a white Roe has been met with, but so seldom as to cause considerable comment amongst sportsmen, and particular notice in the journals devoted to sport and natural history. One shot near Luss, on Loch Lomond side, is preserved in the collection of Sir James Colquhoun, and another may be seen amongst the sporting trophies of the Margrave of Baden, at Zwingenberg Castle, on the Neckar.

The habits of the Roe-deer, as observed in Scotland, have been well described by the brothers Stuart.*

"Like the Red-deer, Roe seek a change of places at various seasons, and it is essential to their condition. In the mountain forests, however, they do not ascend like Red-deer to the heights, but frequent more generally the braes, the woods, and lower pastures. In fine dry weather they lie out in the heather like hares, and nearly as closely. Like all wild herbivorous animals, their feeding-time is from a little before dawn until the sun grows hot, and from sunset until night. During the day they ruminate, or sleep in the deep brackens, heather, blaeberries, or other small coverts, or stand, like horses, in open woods and thickets. In winter they draw in from the hills and moors to the woods and coppices, and as the severity of the season increases, pass down the country from the higher to the lower shelters, to which, if a large and tranquil forest, they will resort for twenty

* 'Lays of the Deer Forest,' vol. ii. p. 149, &c.

miles. In the summer those which remain, and which are generally the natives, keep the close coverts, and are very fond of high ferns, junipers, and thorn jungles, or deep "pots," *i.e.*, small abrupt dells, where the heath or blaeberries grow as high as their crouching bodies; but in wet and snowy weather they go to the tall open woods where the herbage is short, and they are free from the drenching storm and rain which loads the bushes and low branches. On naked or short-clothed ground they always scrape for their bed, laying it bare to the fresh mould. This they will do several times during the night, so that the numbers of a family cannot be judged by their beds, for each will often make three or four in a night. Roe-deer do not wallow in pools like Red-deer, but in hot weather when fretted by flies, to brush them from their heads and flanks they stand by a bush and run round it so continually, that they soon beat a circle like the lunging ring of a horse. In July and August these circuits are often found in bushy woods, and as they occur in the weaning season when the kids are seen pursuing their dams for milk, by those ignorant of their habits, their circuitous runs have been thought an exercise to wean the young." *

Roe-deer are extremely cautious and delicate in their tread, always, except by accident, stepping over fallen sticks, or any object which might make a sound among the dry leaves; and when anxious or watchful, they move with extraordinary silence and caution, planting their feet directly and gently, without any tripping or trailing, and sometimes suspending an extended hind leg while listening, lest in setting it down they should rustle the leaves or otherwise attract notice.

They will take the water readily and are good swimmers. The breadth of a good-sized lake will not deter them from passing to the opposite shore; and Boner states that he has known them cross the rapid Danube even where the current was strongest.

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* On this point Charles St. John writes:—"The Roe have a singular habit of chasing each other in regular circles round particular trees in the wood, cutting a deep circular path in the ground. I never could make out the object of this manœuvre, but the state of the ground proves that the animals must have run round and round the tree for hours together" ('Sport in Moray,' p. 192). Boner explains it thus:—"The mother will play with her kid, bounding now towards and now away from it; and a favourite pastime seems to be to pursue her little one, or be pursued by it, round the stem of a tree. They thus will play at "Bopeep" together, and you may find trees in the forest, round the stems of which a circle is trodden in the ground, from the merry racings of the happy play-fellows" ('Forest Creatures,' p. 31).

This will happen not only when the animal is pursued by the hunter, but when it has discovered beyond its accustomed haunts some unusually good feeding ground, or hears the call of a doe in the breeding season.

The cry of the Roe is a horse bleat, resembling the word *boeuf*, without the final *f*. In Germany the foresters imitate it very cleverly with a piece of coarse grass, or a bit of the inner bark of the birch tree, placed between the lips.

The food of the Roe is of a varied nature; grass, leaves, heather, and the young shoots of spruce and oak forming its chief sustenance. Amongst other plants, the *Rubus saxatilis* is said to be such a favourite as to have earned for it in the Highlands the name of Roebuck-berry. The late Edward Alston once examined the contents of the stomachs of two Roe-deer, buck and doe, shot in the month of October, and found remains of grass, moss, blaeberry leaves, young heather, spruce shoots, a little corn, and numerous fragments of various species of fungi which abounded in the woods where the deer were shot.* This observation has since been confirmed.†

"Nothing can be more graceful," says Charles St. John,‡ "than the light and agile movements of this animal while nibbling the tender shoots of the bushes and trees on which it feeds. The wild rose and the bramble are amongst its favourite morsels; from the long twigs of these plants it nibbles off leaf by leaf in the most graceful manner imaginable. The foresters accuse these animals of being very destructive to the young oak trees, and fond as I am of them, I am afraid I must admit the accusation is just, as they undoubtedly prefer the topmost shoot of a young oak tree to almost any other food. Nevertheless the mischief done to the woods by Roe is trifling when compared to that of Rabbits." St. John might have added that the practice of rubbing their new horns against the branches and stems of trees causes much injury to the young plantations. Where Roe-deer are plentiful you may see in all directions the stems stripped of their bark which hangs down in ribbons.

In severe winters the Roe suffers greatly; it sinks into the deep snow, and may sometimes be found embedded to the flanks,

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* Alston, 'Zoologist,' 1864, p. 9359. † 'The Field,' Aug. 12th, 1871.

‡ 'Natural History and Sport in Moray,' p. 250.

either dead from exhaustion, or so incapacitated as to fall an easy prey to Wolves and Foxes. Nor are these the only enemies it has to contend with. We well remember stumbling one day upon a dead Roe which lay strangled in a snare that had been set in the woods by some wily poacher, who did not, however, reap the reward of his ingenuity. In parts of Germany and Austria, where Roe-deer are more numerous than in this country, they offer a great temptation to poachers, since their comparatively small size renders it much easier to carry them away without the aid of a pony, which could not be dispensed with in the case of the larger Red-deer, unless, of course, the animal were cut up and transported piecemeal.

The general appearance of the Roe must be sufficiently familiar to most people, even to those who have never seen the animal alive, through pictorial illustration. But as artists almost invariably depict the full-grown buck and doe, we have thought it of interest to give in the accompanying plate (Plate I.) a portrait of a young buck with horns "in the velvet," reproduced from an instantaneous photograph.

ON THE SYSTEMATIC POSITION OF THE SWIFTS (*CYPSELIDÆ*).

By W. K. Parker, F.R.S.

My friend the Editor has recently put into my hands a paper on this subject by the late Professor Garrod ('Zoologist,' 1877, pp. 217—220), and invited my criticism thereon. No one valued the work done by that talented young anatomist—so early lost to us—more than I did, notwithstanding that his charity did not abound towards me. The fact of the case was this,—he was always looking at the newest specializations of this or that type, in the modification of the vocal organs, and the circulatory and muscular systems; whilst I was always in search of *old things*, any "unconsidered trifle" that might help me to imagine what sort of parents the first birds had. It seems to me, in endeavouring to form a true estimate of the qualities of Garrod's mind, that he was eminently fitted for *action*, but was too restless and impatient for *contemplation*. Many things in the paper just

referred to are true and well said, but the last words on the relationship of the Swifts to the Swallows on one hand, and to the Humming-birds and Goatsuckers on the other, have not been said yet.

I have just received a short, but valuable paper on the Swifts, by my friend Mr. Frederic A. Lucas, of Washington,* and I am, almost impatiently, waiting for Dr. R. W. Shufeldt's paper on these birds and their relations, which I understand is to appear in the 'Journal of the Linnean Society.'†

For my part, I am always more inclined to observe and study facts, than to make inductions from those facts. In the present short communication I will try and do both.

The Swifts lie between two groups of birds that differ in the most marvellous manner—the *Passeres* and the *Picariæ*, or *Coccygomorphæ;* the former are *five times* as numerous, as the latter are *ten times* more polymorphic, than the former. Moreover, the *Passeres*, with the Raven as their type, are the highest creatures that have arisen from the general mass of the *Sauropsida;* the *Coccygomorphæ* only take a second place; and notwithstanding all their plasticity, their marvellous suppleness, taking on as they have done any size and any shape that might help them in their struggle for existence, they nevertheless form but a small kingdom as compared with the thousands of neat and uniform *Passeres*, birds in which the elements are kindly mixed, and in which the large brain makes possible the highest ornithic intelligence.

Why the Swallows should have come to the top, to be members of this most highly accomplished, most wonderfully endowed order of birds, and why the Swifts should have come short—have missed their mark as to avian nobility—no one can say.

In one respect the Swifts certainly are at the head of the whole class, and that in the most distinguishing attribute of the class; they are the highest of all flying creatures; not only Insects, Pterodactyles, and Bats, but all other "birds of wing" are inferior to them in their distinguishing faculty; they seem to me to have been ready to part with everything that they might

* 'The Auk,' vol. vi. pp. 8—13, figs. 1—3.

† The paper referred to is entitled "Studies of the *Macrochires*, morphological and otherwise with the view of pointing out their relationships, and defining their several positions in the system."—Ed.

obtain this coveted power, and to forego development in their hind limbs, that their fore limbs might carry them more swiftly by far than any of their relatives, "through the great deserts of the air," as Calderon expresses it. I do verily believe that this is the key to the secret—that their large wings have materially detracted from their puny legs.

In matters of this sort I never differ from my friend Dr. Sclater without a strong feeling of misgiving; and yet his expression, that "the Swifts have no relationship whatever with the Swallows, *Hirundinidæ*" (Proc. Zool. Soc., 1865, p. 593), is, I consider, too emphatic to be true.

It would not be true of the relationship of the Swifts to any Passerine bird; for they certainly lie on the Passerine border of the *Picariæ*, if they cannot be put even as abnormal *Coracomorphæ*.

I agree with my friend Dr. Shufeldt that the "Swallow and the Swift are near akin." My own opinion is not the simple judgment it was forty years ago. I have observed a good many things since then in the structure of birds of all sorts.

To take one fact,—all the Passerine birds are "Finch-jawed" (Ægithognathous); no other birds but the Swifts are so, except in an imperfect degree. This peculiar structure, which is isomorphic with what is found among the Mammalia, very commonly, and which arises from a fusion of the vomer (or vomers) with the floor of the nasal labyrinth (base of "middle turbinal" of man), is not the only thing in which the Swifts agree with the Passerines, and disagree with all other birds. Correlated with the Ægithognathous palate I have always found a peculiar structure of the palatine bones. As a rule, in all the Sauropsida and Mammalia the old Ichthyopsidan cartilaginous palatine bar is aborted, and the palatine bone is formed directly from mere membrane. In Ganoids, Osseous fishes and Amphibia, the primary rod of cartilage becomes ossified during growth. In Passerine birds and in Swifts, and in no other kinds, a large "remnant" of the old Ichthyopsidan cartilaginous palatine is developed postero-laterally to the main bony bar, becomes ossified independently, and then becomes fused with that bar, and forms its projecting part, or apophysis.

A second point is that the *Cypselidæ* are very variable. Amongst a few dozen specimens, there is far more variation

in the legs than is seen in the 6000 specimens of true *Passeres*.

Moreover, as Mr. Lucas in the paper above referred to has shown, the wing is extremely variable; in some it is as marvellously modified as in the Humming-bird, in others it comes much nearer to that of the true Swallows, *Hirundinidæ*.

I had just noticed this in fact the day before I received Mr. Lucas's welcome paper in the 'Auk.'

I will now give the measurements of the three main regions of the wing in two of the largest of the *Cypselidæ*:—

	Humerus.	Ulna.	Manus.
Macropteryx mystacea .	24 mm.	29 mm.	47 mm.
Chætura caudacuta .	17 mm.	24 mm.	57 mm.

I leave these facts to tell their own tale, and proceed to one or two more statements. As in all the Passerines, the Swifts and Humming-birds have no second phalanx on the "pollex," nor a third on the "index;" notwithstanding that these are present in the Goatsucker (*Caprimulgus europæus*), the type, certainly, which has the greatest right, next to the Swallow, to be accounted a relative of the Swift.

I have noticed with interest a remark by Prof. Newton, in his valuable article "Ornithology" in the ninth edition of the 'Encyclopædia Britannica.' Speaking of the "Oscines" (p. 47), he says, "This last and highest group of birds is one which, as before hinted, it is very hard to sub-divide. Some two or three natural, because well-differentiated, families are to be found in it; such, for instance, as the *Hirundinidæ*, or Swallows, which have no near relations."

That passage pleases me so much, that for the sake of it I forgive my friend the author for his downright heresy, expressed in the same paper, as to the *non-raptorial* nature of the Owls. I hope as to this that he will be spared to recant.

Bearing on the lonely position of the Swallows in their own proper Order, I have just discovered a most remarkable fact, albeit "an unconsidered trifle." Amongst all *Passeres* and related types, a Swallow is the only bird in which I have found a second or ungual phalanx to the *pollex;* and only one of the many of the *Hirundinidæ* examined by me, with reference to this point, shows it; this is the Sand Martin or Bank Swallow (*Cotyle riparia*);

it is well seen in the embryo, and is not quite obscured in the adult; in the embryo it is relatively as long as in any bird among the *Carinatæ*.

One "last word;" all the *Coracomorphæ* have a peculiar bony bridge over the top of the interosseous space between the second and third metacarpals; it is fused with both those bones. So it is in the *Picidæ*, *Ramphastidæ* and most of the *Alcedinidæ*, in which it is unusually large; in the *Gallinaceæ* generally it is almost as large, but does not unite with the third metacarpal. The rudiment of this part is much larger in Humming-birds than in Swifts, which agree with the Goatsuckers in having this intercalary element aborted.

I have put these facts down on paper; if any one can explain them it were act of charity to us all to show their meaning. Prof. Garrod did not say the last word either about Swifts and Swallows, or about any member of this bewildering class of vertebrates.

NOTES ON A VOYAGE TO THE GREENLAND SEA IN 1888.*

By Robert Gray.

(Concluded from p. 51.)

July 5.—Lat. 74° 40′, long. 12° W. Water clear and blue; temperature, 32°. From a Narwhal shot to-day I removed a fœtus measuring five feet in length. In the stomach of the mother a few worm-like Entozoa were present (*Ascaris simplex*, Rudolphi), while the pharyngeal openings of the Eustachian tubes formed the habitat of another parasitic form, much smaller in

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* In the clause relating to the presence of valves in the throat and vagina of *Mysticetus* the sentence "A somewhat similar but larger structure . . ." (page 43, line 29) has undergone derangement, and instead of reading as in the text should be read as follows:—"A somewhat similar but larger structure attached to the opening of the vagina, evidently acted in the same way; as also did another with regard to the opening of the throat, which on a previous occasion I examined attached to the base of the tongue, but which probably represents the epiglottis." Again, in the footnote, page 48, for "Scotch writers" read "Scotch whalers."

size (*Pseudalius alatus*, Leuchart), for the names of both of which I am indebted to Dr. von Linstow of Göttingen, through the kindness of Mr. John Murray, of the 'Challenger' Commission.

July 9.—Lat. 74° 49′, long. 11° 40′ W. Colour of the water slightly grey; temperature, 35°. In the evening we fell in with a number of Hooded Seals *Cystophora cristata*, lying on the loose ice at the pack-edge. I examined the stomachs of several which were shot. While most were empty, one was packed full with a bluish mud or ooze, in which were embedded the crystalline lenses of two eyes belonging probably to some small species of fish, and the remains of one crustacean common at the surface (*Themisto*). The stomachs of three other Seals contained mud alone. With regard to the presence of mud in these animals' stomachs, while considering the depth of the water too great (in this instance 200 fathoms,—in another, to be afterwards recorded, 1100) to permit the bottom being reached, the only explanation I am able to offer is that the substance must be swallowed in small quantities by the Seals along with their ordinary food (crustaceans living at the surface), and that, owing to its indigestible nature, accumulates in course of time in the stomach. These Seals are occasionally observed disappearing under the ice, for the purpose, I believe, of feeding on the immense number of crustaceans which are known to accumulate there. Many of the ice-fields bear on their surface, immediately under a superficial coating of snow, cargoes of mud (apparently of an alluvial origin). During the process of melting, the mud may accumulate on submerged tongues or ledges of the ice, and thus become the retreat of numbers of crustaceans, which, as they are devoured by the Seals, are swallowed along with a small quantity of the mud.* Some such explanation must, I think, be conceived.

July 16.— ·t. 75° 10′, long. 8° 4′ W. Colour of the water, slightly green emperature, 34°. Saddle Seals very numerous, some lying on the ice, others sporting about in the water. There was a fair proportion of this year's Seals present, the average length of some which I measured being 3 ft. 2 in. from the tip of the nose to the tip of the tail. Unfortunately I did not

* This conclusion is supported by a comparison of the report on the mud from the Seals' stomachs with that of a sample of mud of the ice.

succeed in examining any of their stomachs, but numerous fragments of red crustaceans floating at the surface may have been passed in their fœces. The young Saddle Seals at this season, with their silvery grey coats, marked here and there with an irregular black spot, with their large round black eyes and long delicate whiskers, are perhaps the most beautiful of all the Seals of the Greenland Sea. Their movements, too, have a peculiar grace and elegance, darting about with rapidity under water, performing various movements at the surface, and now and again with remarkable agility leaping clean out of the water—enlivening the solitary regions of the ice.

July 17.—Lat. 74° 37′, long. 9° 30′ W. Colour of the water, greenish but clear; temperature, 39°. The evening being remarkably quiet and fine, I amused myself in the capture of surface invertebrate forms, some species of which were very abundant. The Crustacea were represented by *Gammarus locusta*, an amphipod occurring in great abundance throughout the Arctic Sea and frequently found congregating under the ice; of these many bore eggs. *Euthemisto libellula* (Mandt), so often found in the stomach of the Floe Seal,—a more elegant form than *G. locusta*, and very difficult to capture on account of its agility,—was darting about in considerable numbers; while the copepod *Calanus finmarckicus*, on account of its abundance, the crustacean *par excellence* of the Greenland Sea, and undoubtedly contributing very largely to the support of *Balæna mysticetus* and *Balænoptera Sibbaldi*, existed in great numbers at the depth of a few fathoms. Besides crustaceans, there was an abundance of the quaint-looking shell-less pteropod *Clio borealis*, their wing-like appendages continually moving and meeting one another, both dorsally and ventrally. Some of these *Cliones* were very large, measuring 2½ inches in length. The surface of the water had a very oily appearance, which perhaps was due to the oil-globules which now and again might be noticed floating up to the surface, spreading out and displaying iridescent colours.

July 19.—Lat. 74° 53′, long. 10° 30′ W. The water had a dull lead-coloured appearance, with much oil at the surface lying in streaks, running parallel with the direction of the wind. In one of these oily streaks I noticed a number of Mallemokes busily engaged in eating something present at the surface. On

further examination I found an immense number of *Calani* present where the water was oily, and these crustaceans the Mallemokes were eating. The streaked arrangement of the oil must, I think, be due to the wind blowing it away from more or less stationary areas, where in this case *Calani* were present in abundance, either in the surface or sub-surface waters.

July 24.—Lat. 74° 43′, long. 11° 30′ W. During the last few days we have seen many schools of Narwhals, all of which invariably consisted of full-grown females accompanied by calves. The calves were all about the same size, very small, and evidently only recently born. This observation, together with the finding of the mature fœtuses already mentioned, renders it probable that the Narwhal usually brings forth its young at this season,—an *à priori* conclusion agreeing with previous observations. To-day a female was killed, from which I obtained a fœtus 7½ inches in length,—an illustration of the fact that fœtuses of a similar size are not unfrequently procured during the months of June and July. If there is a regular season for bringing forth the young, the period of gestation would appear to be about twelve months. This agrees with the fact that copulation occurs during May and June. The fœtuses of small size—*e. g.* 7½ in. in length—must, then, be regarded as about two months old. This may appear a somewhat rapid rate of growth, but it is well to bear in mind, as Owen pointed out, that the cetacean fœtus bears, when mature, a greater proportion to the mother as regards size than that of any other animal. In the case of the Narwhal I have measured several fœtuses exceeding 5 feet in length, the average length of the mother being 14 feet; while in *Hyperoodon* I have seen two, both over 10 feet in length, the mother in each case being about 26 feet long. Therefore, both in the case of the Narwhal and in the case of *Hyperoodon*, the fœtus may reach while *in utero* fully one-third the length of the mother.

The colour of the water, which, as I have already mentioned, was everywhere blue and clear when we first visited this locality, has now assumed in many places a dark green colour. The change was gradual, and occurred probably through the development of diatom spores. During the interval the ice had cleared away, exposing the surface waters to the light, evidently the only favourable condition wanting to the presence of vegetable life.

Easterly winds prevailing during the latter part of July, and the ice as a necessary consequence remaining close, we visited the northern grounds, hopeful of obtaining more favourable conditions for the prosecution of the fishing. During our absence several remarkable changes had occurred. The whole of the "S.E. pack" had disappeared, open water extending northward as far as lat. 80°. The surface waters, formerly so extensively turbid and discoloured with Diatomaceæ, were now everywhere clear and blue.

During our progress northward we saw now and again a solitary "Blue-fin Whale" sending its "blast" high and pillar-like into the air, feeding perhaps on *Limacina arctica*, of which there was a considerable abundance in the surface waters. Some of these pteropods, which by the way are not so very common throughout the Greenland Sea as is generally supposed, were of somewhat unusual size, measuring fully 8 mm. in diameter. With regard to *B. Sibbaldi*, a number of observations which I made from the Crow's Nest concerning its breathing gave the following results, *viz.*:—Period under water, maximum 10 min., mean 8 m. 20 s., minimum 7 m.; period at surface, maximum 4 m., mean 3 m. 15 s., minimum 2 m. 40 s.: number of expirations, maximum 15, mean 12·5, minimum 11; period between expirations while at the surface, maximum 20 sec., mean 15·5 s., minimum 13 s.

Besides these Whales there were a considerable number of birds about,—Looms and Rotches, mostly the former with their young, which, although quite unable to fly, had already ventured fully 100 miles away from land. The number of feathers of these birds, floating about on the surface, showed that their moulting season had already commenced.

On reaching lat. 80° we wrought south-westwards along the ice-edge, in search of Whales. Owing to easterly winds, however, the ice had altered greatly for the worse, and with the exception of great numbers of Narwhals hurrying to the N.W., which we saw on the 6th, in lat. 78° 39′, long. 0° 10′ W., there was very little life.

Having overhauled the northern grounds without success, we continued working south-westwards along the ice. The following extracts from my Log will indicate our progress during the rest of the voyage:—

August 12.—Lat. 73° 41′, long. 15° 00′. Colour of the water, dark green; temperature at the surface, 36°. Lay becalmed in a "bight" formed by the ice all day; many Narwhals about, most of which were males with "horns." Early in the morning I discovered several of these animals lying motionless at the surface, evidently asleep. Manning a boat we pulled quietly towards one in this position. As we slowly approached I enjoyed an excellent opportunity of noting its position and movements. After we left the ship, the animal raised its head above water and breathed for a brief interval, relapsing immediately afterwards into its former position. At the distance of a few feet before harpooning it we could easily see that the animal was in a slightly bent position, its tail being immediately under the surface, the pectoral fins outstretched with their surfaces horizontal, the head weighted with a long protruding tusk pointing downwards, and only a small part of the back above the surface. The animal was absolutely motionless, not the slightest trace of any movement being visible,—the spiracle, or "blowhole," being immersed, respiration could not possibly have been going on. From these facts, and a number of somewhat similar observations which I have previously made, I conclude that during sleep, animation being partially suspended, the period during which these animals are able to remain under water, with the respiratory organs excluded from the atmosphere, becomes extended. Let the Narwhal, after having completed the process of respiration and having all its plexuses stored with oxygenated blood, relapse into sleep. During this condition the animal remains motionless, and the position which the body assumes is involuntary and becomes regulated by hydrostatic laws. If the individual in question be provided with a "horn," as the protruding tusk is called, the whole of the head will probably be immersed; if without, as in the case of the female, the opening of the "blowhole" may appear at the surface; but in no case, as far as I have been able to observe, does respiration go on until a protracted period having elapsed, when the animal either awakes or by a reflex movement raises its head, if need be to the surface, and unconsciously respires. Remarkable as these facts may appear, the matter does not rest here; many intelligent whalemen have long held that the cetaceans possess the power of remaining asleep, for a considerable period, under

water entirely removed from the surface. This belief seems to have been suggested by the following facts:—(1.) When a Bottle-nose Whale, *Hyperoodon rostratus*, the only one visible at the time, has been harpooned, has dived, and has again appeared at the surface, it is occasionally accompanied by a number of other Whales not previously in sight. I have made this observation myself on several occasions. May not the harpooned Whale in its distress have sought the assistance of its slumbering friends, with whose position under water it was acquainted? (2.) The appearance, after an absence of a number of hours, of *Balæna mysticetus*, from under a field of ice of such a nature that air-holes could not have existed. (3.) The daily appearance and disappearance, with some regularity, of Whales at the surface. I have noticed this concerning all the cetaceans of the Greenland Sea. (4.) The fewness of Whales seen asleep at the surface, the fact that they are only seen during calm weather when the water is smooth, and never when the sea is stormy,—all of which I am able to corroborate. Keeping these statements in view, and having seen that the Narwhal may be found motionless at the surface with the "blowhole" under water, a position practically equivalent to complete submersion, —and remembering (*a*) that the state of the sea is seldom so quiet as to permit an animal resting with comfort at the surface; (*b*) that, the animal remaining motionless and the position assumed being necessarily involuntary, it is doubtful whether the spiracle would in all cases appear above water; (*c*) the position assumed being such that the spiracle would appear above water, —it is questionable, owing to the low power of flotation, whether inspiration would be safe without voluntary or highly complex reflex action on the part of the animal. I venture to arrive at the following conclusions, *viz.*, that in the Cetacea, during the condition known as sleep, the animal remains absolutely motionless and passive, respiration occurring at prolonged intervals, when the animal either awakes and performs the function consciously, or, its sleep remaining unbroken, the necessary movements are brought about by a series of reflex and involuntary actions acquired by habit. The depth at which the function is performed seems to be determined by depth to which the wave-motion may extend, immunity from disturbance in all cases being secured; the animals appearing at the surface only when

the sea is smooth, the spiracles not necessarily being above water.

August 17.—Lat. 73° 1′, long. 14° 46′ W. The water a beautiful olive-green colour; temperature at the surface, 39°. *Calanus finmarckicus* abundant, with their alimentary canals filled with Diatomaceæ. While we were lying near the ice a strange Whale appeared near the ship; it was swimming backwards and forwards in a somewhat erratic matter; its dorsal fin, which was prominent and situated well forward on the animal, frequently appeared above water. On approaching with a boat I found the water alive with *Calani* where the Whale (probably a Hunchback, *Megaptera longimana*) was swimming, and on which it was probably feeding, although a small fish with silvery scales, dangling from the beak of one of a number of Arctic Tern which were flying overhead, shook somewhat my faith in this belief.

August 20.—Lat. 71° 39′, long. 14° 15′ W. Water olive-green; temperature, 34·5°. Many Blue-fin Whales in sight all day: for some time in the morning, while lying becalmed, we were quite surrounded by these huge cetaceans, the noise of their blasts being almost incessant. I noticed one young animal about twenty feet in length.

August 22.—Lat. 71° 10′, long. 15° 48′ W. A few Bladder-nose Seals lying on the ice, two of which were shot. The stomach of one was empty, while the second was packed full of fine bluish mud, similar in appearance to that obtained on July 9th from the stomachs of Seals of the same species. At night we made our way towards the sea, and next day bore up, arriving at Peterhead on September 3rd.

I conclude these notes by appending a list of the contents of stomachs of Whales, Seals, and Birds examined during the voyage of the 'Eclipse.' The species determined through the kindness of Dr. John Murray, of the 'Challenger' Commission:—

Bottle-nose Whale, *Hyperoodon rostratus*.—April 25th: 68° 28, 5° W.; contained abundant remains of the cephalopod, *Gonatus fabricii* (determined by Mr. W. E. Hoyle).

Narwhal, *Monodon monoceros*.—1. July 1st: 74° 37′, 11° W.; contained remains of Cuttlefish and fragments of *Pasiphaë tarda*, Kroyer (determined by Prof. Sars). 2. July 5th: 74° 40′, 12° W.;

contained Cuttlefish remains. 3. July 22nd: 74° 49′, 10° 30′ W.; contained Cuttlefish remains, hundreds of mandibles and crystalline lenses, and the fleshy portions, in a more or less digested condition, of at least eleven specimens of *Gonatus fabricii* (determined by Mr. W. E. Hoyle); also crustacean remains belonging to two different species, both large and bright red in colour,—the largest *Pasiphaë tarda*, which was also present in greatest quantity, measuring six inches in length, the other *Hymourdora glacialis*, Buchholz, 2½ inches (the latter also determined by Prof. Sars). 4. August 12th: 73° 41′., 15° W.; contained Cuttlefish remains (specimens recognised as belonging to *Gonatus fabricii* by Mr. Hoyle).

Saddle Seal, *Pagophilus grœnlandicus*.—1. June 16th: 75° 50′, 6° 9′ W.; contained *Euthemisto libellula*, Mandt and Lichtenstein, and *Nyctiphanes norvegica* (the former determined by the Rev. T. R. R. Stebbing, M.A., of Tunbridge Wells, the latter by Dr. Murray). 2. July 9th: 74° 49′, 11° 40′ W.; contained *E. libellula* alone.

Hooded or Bladder-nose Seal, *Cystophora cristata*.—July 9th: 74° 49′, 11° 40′ W. 1. Bluish mud or ooze, with a few fishes' eyes and crustacean remains, *Euthemisto libellula*. With regard to the mud Mr. F. G. Pearcey, of the 'Challenger' Commission, reports as follows:—A blue mud, coherent, homogeneous, gritty; shows no perceptible effervescence when treated with dilute HCl. A few fragments of sponge spicules and one or two diatoms were all the organisms observed: the mineral particles make up probably 50 per cent. of the whole, having a mean diameter of 0·2 mm., angular and rounded, consisting of quartz, zircon, feldspar, hornblende, oliöine?, mica, magnetite, and some red-brown coloured particles like glauconite; *silicious organisms* 2 per cent., sponge, spores, and diatoms; *fine washings* 28 per cent., consisting of argillaceous matter and many fine mineral particles. 2. Mud alone present: according to Mr. Pearcey the mud present in this stomach is similar to the last, but the mineral particles are somewhat larger, the mean diameter being 0·3 mm.: the same organisms are present. 3. Mud alone present, similar to the above, according to Mr. Pearcey, but contains in addition a few small otoliths of fish and beaks of cephalopods. 4. Aug. 22nd: 71° 10′, 15° 41′ W. Mud alone present, similar to above. To permit comparison, a report by Mr. Pearcey on a sample of mud

off the surface of the drift ice, obtained in this latitude last season, is here inserted:—"Yellow-brown clay, very coherent, homogeneous?, dries into hard lumps, showing lustrous streak dark brown when wet, unctuous, shows no traces of carbonate of lime when treated with an acid. A few diatoms and sponge spicules were all the organisms observed. Deposit made up of 50 per cent. of minerals, having a mean diameter of 0·06 mm., rounded and angular, consisting of quartz, mica, feldspar, hornblende, zircone, and magnetite, with a few coloured altered particles. *Silicious organisms* 2 per cent., consisting of diatoms and one or two fragments of sponge spicules. *Fine washings* 48 per cent. Amorphous clayey matter with many mineral particles and a few diatoms."

Floe Seal, *Pagomys fœtidus*.—1. May 12th: 71° 18′, 6° 37′ E. *Euthemisto libellula*, *Nyctiphanes norvegica*, and a few Cuttlefish remains. 2. June 2nd: 78° 47′, 3° 6′ E. *E. libellula* and *Gammarus locusta*. 3. June 7th: 78° 00′, 2° 30′ W. Entirely filled with *E. libellula*, mostly of large size, some measuring 40 mm. in length. 4. *E. themesto*, and a few immature examples of *N. norvegica*. 5. June 26th: 73° 1′, 13° 31′ W. Full of *N. norvegica*. half grown.

Brunnich's Guillemot, or Loom, *Alca arra*.—May 12th: 78° 18′, 6° 37′ E. One stomach examined; contained a small pebble and the otolith of a fish. May 19th: 79° 40′, 4°6′ E. Seventeen stomachs examined; one contained mostly young *E. libellula*, but also a few some 30 mm. in length; the others either empty or contained only a few pebbles of sandstone or other rock.

Little Auk, or Rotch, *Mergulus alle*.—May 12th: 78° 18′, 6° 37′ E. A number of stomachs examined were found to contain *Calanus finmarckicus* in greatest quantity, but also *E. libellula* and a few young of *N. norvegica*.

Black Guillemot, or Dovekie, *Uria grylle*.—A few stomachs examined contained in most cases crustacean remains, probably *E. libellula*, in others only a few pebbles.

NOTES AND QUERIES.

MAMMALIA.

A New Australian Mammal.—In 'The Zoologist' for November, 1888, under this heading (p. 424) we referred to the then recent discovery near Adelaide of a small burrowing animal, externally resembling the Cape Mole (*Chrysochloris*), but differing from it as we pointed out in several important respects. Another new mammal from Australia has since been described by Prof. Milne-Edwards, in a memoir lately published by the Société Philomathique de Paris. He refers it to the genus *Dactylopsila* from New Guinea, and has named it *Dactylopsila palpator*. It is said to be remarkable for the extraordinary length of the fourth digit of the fore-limb, which is more than an inch longer than the adjoining digits, exceeding even in its proportions the curious third finger of the Madagascar Aye-Aye (*Chiromys madagascariensis*).

BIRDS.

Note on Willow Wrens.—In reply to Mr. Gurney's suggestion (p. 77), that the large, light-coloured, yellowish warbler shot by me at Cley was a Wood Warbler, I wish to say that the wing-formulæ, and especially the comparatively long first primary, proved that it was an undoubted Willow Wren. It was apparently an example of the large and (so-called) dark-legged race, of which Lord Clifton wrote in 'The Field' for August 16th, 1884. Lord Clifton described a male of this race, received from Mr. Swaysland, of Brighton, in spring, as considerably larger than the Wood Wren, of a deep brownish olive above,—something like the Garden Warbler,—with a band of deep buff, inclining to yellow, across the breast; and a female, received with the eggs, as having the same distribution of buff, but much paler, and the upper parts greyish olive without any brown tint; legs in both, neutral coffee-brown, but not so dark as in the Chiffchaff; feet as dark as, if not darker than, the legs. It is upon this last point that Lord Clifton lays great stress, stating that in the typical Willow Wren the feet are yellowish, and at all ages paler than the legs; soles of the feet bright yellow. I have a skin of the large Willow Wren, shot at Spurn Point, Yorkshire, in August, 1885 (apparently a bird of the year), and given to me by Mr. J. H. Gurney, jun., which agrees very well with my note of the Cley bird (which was not preserved), and also (making allowance for the difference in the time of the year at which the specimens were procured, and the different ages of the birds, Lord Clifton's being presumably adult) agrees in some points with the description in 'The Field' above quoted. My specimen is quite as large as, if not larger than,

the Wood Wren; it possesses the deep breast-band, has dark legs, and feet as dark as the legs. I do not think, however, that much importance can be attached to the colour of the Willow Wren's legs and feet, as this seems a rather inconstant and uncertain character. For instance, in three specimens procured on the same day in May, these parts were coloured as under:—*a* and *b*, legs light brown, feet and claws paler; *c*, legs and feet medium brown, claws darker. The soles of the feet in all three were clay-coloured, and in my experience it is only in birds of the year that they are bright yellow; a bird of the year procured in the following September had them so coloured. In a male and female procured in April, both with pale legs, the feet (in the dried skins) are no paler, but in a young bird procured in August they are decidedly so. On the other hand, in a male sent to me from Rainworth, Nottinghamshire, by Mr. Whitaker, early in May, 1887, the legs are dark brown, darker than those of the Spurn bird, and nearly as dark as those of the Chiffchaff; feet decidedly darker, and as dark as in the latter bird. Yet this example is no larger than typical Willow Wrens. It is a very grey bird, and bears some resemblance to those described by Mr. H. Seebohm (Brit. Birds, vol. i.) from high latitudes, with "all the yellow and green abraded, leaving the general colour earthy brown, the eye-stripe having faded to a greyish white." My grey bird, however, still exhibits a little dull greenish yellow on the upper parts, and the eye-stripe is slightly tinged with the same, but there is very little sign of the usual yellow and buff on the under parts. Laid side by side with an ordinary Willow Wren, also procured in spring (four days only earlier in the year), the difference in the appearance of the two birds is very striking. Dark legs then cannot be said to characterise the larger race of Willow Wren.—Oliver V. Aplin (Bloxham, Banbury).

Thick-knee in Essex in January.—A specimen of the Norfolk Plover, or Thick-knee, *Œdicnemus crepitans*, was shot on the marshes near here last month. This is perhaps worth recording, as the bird, being of migratory habits, usually leaves us about September. Just previously a fine Peregrine Falcon was picked up on the same marshes. It had been shot at and wounded, but was alive when found.—A. F. Gates (Marsh Gate Lane, Stratford).

Reported Nesting of the Redstart in December.—There appeared in the local papers at Scarborough an account of a Redstart's nest and eggs being discovered on Christmas Day. Knowing that the Redstart is a summer visitor only, I went to the place where the nest had been found (Hackness, a small village some six miles from Scarborough), and made inquiries. I was fortunate enough to find the individual who discovered the nest, and I obtained the following information:—The nest, which was placed in a hole in an oak tree, was built of "wicks" moss and grass, and

lined with hair and feathers. The bird, which was seen to leave the place was described as "a small brown bird with a red tail." The egg, which is unfortunately broken, is undoubtedly that of the Common Redstart. Is not this a most uncommon occurrence? The Redstart has hitherto been looked upon as a summer visitor only, coming in April nd leaving about September. Yet here are two birds, which have apparently passed the winter with us, and actually have a nest and two eggs on the 25th of December. Has any similar case been known? I cannot hear of one in this district.—W. J. CLARKE (35, Londesborough Road, Scarborough).

[Were it not for the assertion that the egg examined was undoubtedly that of the Common Redstart, we should have been inclined to suspect that it was that of the Wren, this bird, like the Robin, occasionally nesting during the winter months when the season is a mild one.—ED.[

Little Gull, near Penzance.—I have lately (Feb. 15th) received from St. Just, to the west of Penzance, an adult specimen of the Little Gull, *Larus minutus*. It weighed a little under 7 oz., and measured 13 in. from tip of bill to end of tail feathers, the expanse of wing being 2 ft. 9 in., or more than double the length of the bird. It is now being "set up," and will soon be on view should any one like to call on me and see it.—THOMAS CORNISH (Penzance).

Recollections of the Bustard in Suffolk.—I had lately the pleasure of a conversation with perhaps the only person who can claim to have seen the indigenous race of Suffolk Bustards, both alive and dead, as well as their nests and eggs. Mr. W. Bilson, formerly a bird-stuffer in Bury, who was born in 1808, happened to call on me, and while looking over my birds the Great Bustard was mentioned. Mr. Bilson well remembers as a lad seeing the eggs in a Bustard's nest at Icklingham, and as the then owner of the Icklingham estate was very careful to preserve the few remaining Bustards, the eggs in question were, to the best of my informant's knowledge, left undisturbed. This would probably be between 1818 and 1825. He also told me that a man once sold his father a hen Bustard freshly killed for £3, and subsequently offered him a fine cock bird for £10, but the two could not come to terms, Mr. Bilson, sen. declining to go beyond £7; however, the owner of the Bustard obtained his price from another customer. He can also recollect once seeing near Thetford a cock Bustard, flying with (as he expressed it) "the pouch hanging down." Whether or not the pouch is perceptible during flight, or whether the long neck-feathers were mistaken for the pouch, I must leave for those to decide who have seen the Great Bustard on the wing.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

[The hen Bustard bought by the father of Mr. Tuck's informant was doubtless that trapped at Eriswell, as mentioned by the late Mr. Stevenson

(Birds Norf. ii. pp. 35, 36); but the cock bird was (we understand from Prof. Newton, who had the story from Mr. W. Bilson in 1855) offered to his father by the notorious otidicide George Turner.—Ed.]

Sand Grouse in Yorkshire.—I have to report the occurrence of three Sand Grouse, one male and two females, which have come into my possession. One of the females was found dead in a fallow field near York, and the other two were shot near Beverley in June last. The male bird was a particularly fine one, by far the best I have seen out of some sixty specimens which I have examined; the bright orange feathers at each side of the head being unusually fine, and the length of the two central tail feathers, and the first primary of each wing, being especially noticeable. The majority of the birds I have seen were in poor plumage (some well advanced in moult), and chiefly females. The sixty specimens examined by me were all shot in Yorkshire.—William Hewett (3, Wilton Terrace, Fulford Road, York).

Pallas's Sand Grouse in Cornwall.—I was much interested in Mr. Southwell's article on 'Pallas's Sand Grouse,' which appeared in the 'Zoologist' for December last; for during the previous months of August, September, and October, I was the fortunate possessor of a live male of this species. It was fairly tame when I received it, having then been in captivity about two months, and consequently I could observe its actions to advantage. Mr. Southwell mentions, from information he was able to gather, that when in captivity the Sand Grouse show a great indifference to water. I kept my bird in a cage made out of an old wine-case padded at the top to prevent injury to the bird when flying up suddenly. The bottom of the cage I covered with fine sea-sand about an inch in depth, but I soon had to substitute straw, as I found the bird's legs and belly were always in a mess from its persistently getting into the water-trough. I at first thought it had fallen in by accident when flying to the top of the cage, but having watched it for some time, I saw it on several occasions deliberately get into the water and remain there for some minutes at a time. On different occasions I have seen it drink, which it did after the manner of a Pigeon, filling the throat well before lifting its beak out of the water. Unfortunately it never got through the moult, and died in the month of October. On January 3rd, I had brought to me in the flesh another male Sand Grouse. It had been shot at Kelynack, in St. Just-in-Penwith, the same place from whence I obtained my live specimen.—Thomas Cornish (Penzance).

Sand Grouse in Kent.—It may interest you to hear that a specimen of Pallas's Sand Grouse was picked up in the fog on the 14th December last with its head cut clean off, lying underneath the telegraph wires on the Isle of Grain railway. Three weeks previously four Sand Grouse had been

seen on a ploughed field five miles distant, which when disturbed, about ten yards off dropped again in the same field.—W. PRENTIS (Rainham).

Weight of the Pectoral Sandpiper.—Referring to the question which has arisen (p. 73) as to the weight of the Pectoral Sandpiper, I may remark that one which was shot in Norfolk, in September, 1887, weighed 2½ oz., as reported by Mr. R. W. Chase (Zool. 1887, p. 433), in whose collection that specimen is preserved.—J. H. GURNEY, jun. (Keswick Hall, Norwich).

Dusky Redshank in Summer Plumage in Lancashire.—I don't know whether the occurrence of a Dusky Redshank (*Totanus fuscus*) on the coast of Lancashire is sufficiently unusual to merit a notice in the 'Zoologist,' but I may report that one was shot by a keeper in the month of April, four or five years ago, and he still has it stuffed. I had a good look at it, and found that it agreed exactly with the description in Yarrell's 'British Birds,' except that the legs and the dark red base of the lower mandible have lost their colour. The back also was whiter than I expected, but he explained that he had made the white show as much as possible for effect. When first observed the bird was standing by a pool on the "marsh" land near the mouth of the Ribble, and was quite tame, and he shot it on the ground. It is in the sooty black summer plumage as I suppose all these birds are in April.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

[Although *Totanus fuscus* is an annual migrant to the British Islands, passing through the country twice a year in spring and autumn, it is much less common during the former than the latter season. We have often seen it in September and October, but on two occasions only have we met with it in the breeding plumage, once in Breydon Harbour, Norfolk, and once in Pagham Harbour, Sussex, and have seen but few specimens in the black plumage procured in England. We remember once when staying at Abbeville in the autumn, and shooting on a marsh near St. Valery, on the south bank of the Somme, we fell in with a small flock of these birds, which were still in the black plumage peculiar to the breeding season. They were too wild however to suffer a sufficiently near approach to shoot one.—ED.]

Destruction of Eagles.—I observe with much pleasure the editorial protest against the destruction of Golden Eagles (p. 31), and, as I feel rather strongly on the subject, perhaps I may be allowed to emphasise, from personal observation, what has been said. In 1886 I was in North Uist, and enquired after a pair of Golden Eagles that had an eyrie on the island. They were protected by the proprietor. Were they thriving, then? No; they had nested duly, but the male bird had been trapped or shot, and the survivor was left a widow. In 1887 a pair of Golden Eagles occupied an eyrie in Skye. Of course, they bred? No; a keeper succeeded in

destroying one of them while the nestlings were still young. In 1888 another pair of Golden Eagles nested on the Skye coast: they had bred for several years just on the march between two properties, and, though our shepherds complained of losing lambs, we had been delighted to encourage them. In May, 1888, a keeper laid out some poisoned rats for Hooded Crows: one of the breeding Eagles took the poison, and its carcase was found on the hill-side some weeks later. I have its skeleton. These are instances of the destruction that goes on in spite of the efforts of proprietors to protect their Golden Eagles. The White-tailed Eagle has been similarly persecuted, and is all but extinct in Skye. Only a few years ago one miscreant shot an old bird of this species on her eggs, and sent bird and eggs to a collector in the South. On another occasion a shooting tenant shot the feathered young in the nest, as he could not get them alive. But I believe that most mischief is done by egg-collectors, who corrupt the morals of keepers and shepherds. One Edinburgh tradesman is reputed to have obtained a hundred Eagles' eggs from the Scottish Highlands; and if I was at liberty to reveal confidences, I could show that the instigators of egg-stealing are not all dealers by profession, as one would have supposed, but often men who well know what harm they are doing.—H. A. Macpherson.

Night Heron in Ireland.—A specimen of the Night Heron, *Nycticorax griseus*, was shot on December 31st, in an old quarry on the south side of Dublin. The bird is in the immature spotted plumage, was in very good condition, and measured 3 ft. 5 in. from tip to tip of wings, 1 ft. 11¾ in. from point of bill to end of tail. The stomach contained the remains of frogs.—Edward Williams (2, Dame Street, Dublin).

FISHES.

Clupea Finta, Cuv., at Killarney.—The occurrence of a Shad, *Clupea finta*, Cuv., in Killarney Lake, was first made known by the late William Andrews, who was informed that "Herrings" were occasionally captured by the fishermen. Charr are also often called "Herrings" in many of the Irish lakes, and I have obtained specimens of both Shad and Charr from the Lower Lake of Killarney. These Shad are taken by the "trawlers" when drawing their nets for Salmon, and especially when using a smaller mesh for Trout. I never saw any specimens at all equal in size to the Shads, also *A. finta*, which are taken in the river Moy, of which I have now before me a specimen measuring nearly 24 inches in length; or the so-called "Bony Horsemen," (*A. finta*), which in May frequent the mouth of the Blackwater in Waterford to the length of 20 inches. When visiting Kerry I often tried to ascertain whether anything was known of the breeding habits of the Killarney Shad, and whether it is ever found

ascending from the sea. But the result of my enquiries was that I could never hear of any being taken, either in the river Laune, or in the salt water. They are captured in numbers, and of various sizes according to the season of the year, always small, up to about Herring size; and I am now inclined to believe that these small Shads are resident in the Lake of Killarney, as in some of the Italian lakes. If this surmise is correct, we have here an instance of a land-locked Shad, resident and breeding in fresh water, perhaps an incipient species.—A. G. More (92, Leinster Road, Dublin).

New British Fishes.—At a recent meeting of the Zoological Society, Dr. Günther exhibited and made remarks on some fishes which had been taken on the west coast of Scotland by Mr. John Murray, and which were not previously known to occur in British waters. They were *Cottus Lilljeborgii* (Colett), *Triglops Murrayi* (sp. n.), *Gadus Esmarckii* (Nilsson), *Onus Reinhardti* (Colett), *Fierasper acus* (Brünnich), *Stomias ferox* (Reinhardt), and *Scopelus scoticus* (sp. n.). He also exhibited a specimen of *Lichia vadigo* (Risso), known previously only from the Mediterranean and Madeira, and which was taken in September last by Capt. MacDonald, off Waternish Point, Isle of Skye.

Hybrid between Roach and Bleak.—At the same meeting of the Zoological Society, Dr. Günther exhibited a hybrid between the Roach, *Luciscus rutilus*, and the Bleak, *Alburnus alburnus*, which had been taken in the river Nene, Northamptonshire, and forwarded by Lord Lilford.

PROTRACHEATA.

Peripatus in Victoria.—In 'The Zoologist' for February, 1888 (p. 69) we published a letter from Mr. A. Sidney Olliff, of the Australian Museum, Sydney, announcing his discovery of *Peripatus* (presumably *P. Leuckhartii*) in New South Wales, on a tributary of the Hunter River, about 120 miles from the coast. Mr. Arthur Dendy, formerly of the British Museum (Nat. Hist.), but now of the University of Melbourne, writes to say that in December last, while exploring a fern-tree gully at Warburton, on the Upper Yarra, Victoria, he found two specimens of *Peripatus*, believed to belong to a new and very beautiful species. He is not yet certain whether it is identical with the *Peripatus* recorded by Mr. Fletcher, from Victoria (Proc. Linn. Soc. N. S. Wales, vol. ii. part i. (1887), see 'Zoologist,' 1888, p. 69), but can only state at present, that if Mr. Fletcher's species be *P. Leuckhartii*, the newly acquired specimens do not agree with the description of that species published by Prof. Sedgwick, in his Monograph of *Peripatus*, printed in the 'Quarterly Journal of Microscopical Science.'

SCIENTIFIC SOCIETIES.

Linnean Society of London.

February 5, 1889.—Mr. C. B. Clarke, M.A., F.R.S., Vice-President, in the chair.

Messrs. J. R. Green and J. W. White were admitted Fellows of the Society; and, on a ballot taking place, the following were elected:—The Earl of Ducie, Messrs. Henry Hutton and Malcolm Lawrie.

The Rev. E. S. Marshall exhibited several interesting varieties of British plants collected by him in Scotland, and made remarks thereon.

Mr. E. M. Holmes exhibited a specimen of a new British Marine Alga, *Rhododermis elegans*, Cr., var. *polystromatica*. Previously this Alga was only known to occur at Brest. The discovery of it at Berwick-on-Tweed by Mr. E. L. Batters, and at Bognor by Mr. Holmes, therefore extended its geographical distribution. The variety found in Britain was new to science, since the typical plant was found by Crouan to have only two layers of cells, whilst the British plant had several, although it did not otherwise differ from the type.

A paper was then read by Mr. A. D. Michael on three new species of parasitic *Acari* discovered by him in Derbyshire during the autumn of 1888. These were a *Myocoptes*, proposed to be called *M. tenax*, parasitic on the Field Vole, *Arvicola agrestis*; a *Symbiotes*, proposed to be called *S. tripilis*, parasitic upon the Hedgehog; and *Goniomerus musculinus* (gen. et sp. nov.), a minute parasite found on the ear of the Field Vole. Specimens of all three were exhibited under the microscope, and a discussion followed in which Professors Mivart, Stewart, and Howes took part.

Prof. Martin Duncan then gave the substance of an important paper which he had prepared, entitled "A Revision of the Families and Genera of the *Echinoidea*, recent and fossil." Reviewing the labours of his predecessors, Prof. Duncan traced the growth of the literature of his subject, and showed that although many lists and papers had been published from time to time, no general review of the class *Echinoidea* had been attempted since 1846. Dealing with all the material at his command, he found it necessary to propose certain alterations in the classification, and to dispense with a good many genera and subgenera, which he considered had been needlessly founded. Above all, he had set himself the task of revising the descriptions of the genera, giving positive instead of comparative characters, a course which he believed would prove of great utility to students. The paper was criticised by Mr. Sladen, Prof. Stewart, and Mr. Breeze, all of whom testified to the necessity which had arisen for some authoritative revision of the subject such as had been undertaken by Prof. Duncan, and

which undoubtedly would lighten very considerably the labours of future enquirers.

The meeting adjourned to February 21st.

Zoological Society of London.

February 5, 1889.—Dr. St. George Mivart, F.R.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1889.

Mr. Sclater exhibited a living specimen of the Thick-billed Lark, *Rhamphocoris clotbeyi*, lately received by the Society from Southern Algeria, and called attention to its structural peculiarities.

Mr. G. A. Boulenger read a paper on the species of Batrachians of the genus *Rhacophorus*, hitherto confounded under the name of *R. maculatus*, and pointed out their distinctions.

Mr. Sclater pointed out the characters of some new species of birds of the family *Dendrocolaptidæ*, which were proposed to be called *Upucerthia bridgesi*, *Phacellodomus rufipennis*, *Thripophaga fusciceps*, *Philidor cervicalis*, and *Picolaptes parvirostris*.

A communication was read from the Rev. O. P. Cambridge on some new species and a new genus of Araneidea. Two of these species (*Pachylomenus natalensis* and *Stegodyphus gregarius*) were based on specimens living in the Insect House in the Society's Gardens.

A communication was read from Prof. F. Jeffrey Bell, containing descriptions of new or rare Holothurians of the genera *Plexaura* and *Plexaurella*.

Dr. Günther exhibited and made remarks on some fishes which had been dredged up by Mr. John Murray off the west coast of Scotland, and were not previously known to occur in British waters, viz. *Cottus lilljeborgii* (Collett), *Triglops murrayi*, sp. n., *Gadus esmarckii* (Nills.), *Onus reinhardti* (Collett), *Fierasper acus* (Brünn.), *Scopelus scoticus*, sp. n., *Stomias ferox* (Reinhardt).

Dr. Günther also exhibited and described a specimen of *Lichia vadigo* (Risso), a species of which only a few specimens were previously known from the Mediterranean and Madeira: this specimen was obtained by Capt. MacDonald on Sept. 17th, 1888, off Waternish Point, Isle of Skye. He also exhibited a hybrid between the Roach (*Leuciscus rutilus*) and the Bleak (*Alburnus alburnus*), sent to him by Lord Lilford from the river Nen, Northamptonshire.

Mr. Beddard read a paper descriptive of the coloured epidermic cells of *Æolosoma tenebrarum*.

Mr. Boulenger exhibited and made remarks on a series of living

specimens of Tortoises of the genus *Homopus* from the Cape Colony, lately received by the Society from the Rev. G. H. R. Fisk.—P. L. Sclater, *Secretary.*

Entomological Society of London.

February 6, 1889.—The Rt. Hon. Lord Walsingham, M.A., F.R.S., President, in the chair.

The President announced that he had nominated Capt. H. J. Elwes, Mr. F. Du Cane Godman, F.R.S., and Dr. Sharp, Vice-Presidents for the session 1889-90.

The Rev. F. D. Morrice, M.A., of Rugby; Mr. A. Robinson, B.A., of Brettanby Manor, near Darlington; and Mr. H. Burns, of Fulham, S.W., were elected Fellows.

Lord Walsingham exhibited a larva of *Lophostethus dumolini*, Guer., sent to him by Mr. Gilbert Carter, from Bathurst, West Coast of Africa.

Mr. G. T. Porritt exhibited several melanic specimens of *Boarmia repandata* from Huddersfield, and, for comparison, two specimens from the Hebrides. Mr. M'Lachlan remarked that melanism appeared to be more prevalent in Yorkshire and the north midlands than in the more northern latitudes of the United Kingdom.

Capt. Elwes read a paper "On the genus *Erebia*, and its geographical distribution." The author, after referring to the number of species and named varieties, many of which appeared to be inconstant as local forms, made some remarks on the nomenclature of the genus, and suggested that a better system of classification might be arrived at by anatomical investigation. It was stated that little was known of the early stages and life-history of species of this genus, the geographical distribution of which was Alpine rather than Arctic. The author remarked that it was curious that there was no species peculiar to the Caucasus, and that no species occurred in the Himalayas, where the genus is replaced by *Callerebia;* that none were found in the Himalo-Chinese Subregion, and none in the Eastern United States of America. He also called attention to the similarity of the species in Colorado and North-West America to the European species. Lord Walsingham, Mr. Waterhouse, Mr. O. Janson, Mr. M'Lachlan, Dr. Sharp, and Mr. Jenner Weir took part in the discussion which ensued.

Mr. W. Warren read a paper "On the *Pyralidina* collected in 1874 and 1875 by Mr. J. W. H. Traill in the Basin of the Amazons."

Mr. C. J. Gahan read a paper entitled "Descriptions of new or little-known species of *Glenea* in the Collection of the British Museum."

Dr. J. S. Baly communicated a paper entitled "Notes on *Aulocophora* and allied genera."—H. Goss, *Hon. Secretary.*

NOTICES OF NEW BOOKS.

Our Rarer Birds: being Studies in Ornithology and Oology. By Charles Dixon. With Twenty Illustrations by Charles Whymper, and a Frontispiece by J. G. Keulemans. 8vo. pp. 373. London: Richard Bentley & Son. 1888.

The title of Mr. Dixon's book is not well chosen, for to those who are tolerably familiar with British birds it does not convey an accurate indication of the contents. We will not do Mr. Dixon the injustice to suppose that he really regards as rarities a number of Birds which most naturalists agree in considering very common (that is, common in their natural haunts and at their proper seasons); but when we find classed as rarities such familiar species as the Brown Owl, the Butcher-bird, Nightingale, Reed Warbler, Green Woodpecker, Nightjar, Stock Dove, Turtle Dove, three or four kinds of game, and such well-known shore-birds and sea-birds as any one may meet with in the course of an ordinary walk along the coast, we fail entirely to appreciate the author's idea of rarity. That he has enjoyed good opportunities however for studying a variety of birds in their natural haunts is evident from his descriptions, many of which are well written, and accurate so far as they go, though they do not contain much that is new. The freshest paragraphs, perhaps, are those which relate to the habits of some of our British birds as observed abroad, and these are interesting enough. Take, for example, the case of our well-known Hawfinch, concerning which Mr. Dixon writes:—

"I had many opportunities of studying the habits of the Hawfinch in the evergreen-oak forests of northern Africa. One would almost be led to think that the cause of the bird's shyness in England was owing to the manner in which it is persecuted by gardeners and collectors, if we did not find it just as wild and wary in these forest solitudes where it is never molested by man. I first met with the Hawfinches in a clearing of the forest, where the trees were scattered up and down in little clusters, and, as a rule, it was only when they flew from tree to tree that I could get a view of them. Sometimes I observed them sitting quietly among the branches, turning their large heads from side to side in evident alarm, and peering about in all directions as if in search of the danger. The flight of the Hawfinch is undulating, but sometimes straightforward, and is then

very rapid. As the birds flew from tree to tree, I noticed that they usually dropped down into the branches in preference to flying up into them from below. When sitting in the trees the males occasionally uttered a twittering note, which put me in mind of the Greenfinch. In fact, the Hawfinch possesses slight claim to rank as a songster; in the vernal year it utters a few loud notes, which might almost be called monotonous, if several birds did not join in the chorus, when the general effect is far from unpleasing. Many birds love to perch in conspicuous positions when engaged in song, but the Hawfinch twitters from the dense recesses of the foliage, and keeps well out of sight amongst the trees.

Writing of the Pied Flycatcher (p. 51) he says:—

"I have had many opportunities of studying the habits of this interesting bird, both in North Africa, where it is specially common, and in the wooded hill districts of Yorkshire. In the former country I met with it both in the oasis of the Sahara, as well as in the Arab gardens high up the solitudes of the Aures Mountains. In England it loves the birch coppices near the mountain streams, especially where old decaying timber is abundant; and in all situations its conspicuous dress of black and white makes its identification easy. . . . In Africa this species is constantly to be seen in company with the Spotted Flycatcher, but in Great Britain the haunts of the two species are considerably different,—one bird loving the wilderness, and the other cultivated localities and the habitation of man."

It would have been well, perhaps, if Mr. Dixon had told us a little more about the St. Kilda Wren, which from his remarks might be supposed to have been unknown until, as he says, he was fortunate enough to discover it some four years ago. All that Mr. Dixon really did was to remind ornithologists that a Wren existed on St. Kilda, which was little known for the reason that few naturalists visit that remote isle. But it was no new discovery, for the bird in question may be found mentioned in Macaulay's 'History of St. Kilda,' 1764; and even longer ago than that, in Martin's 'Voyage to St. Kilda,' 1698. Mr. Seebohm, in 1884, conceiving from its isolated haunt that it might present some peculiarity as insular forms often do, and believing from examination of a specimen brought from St. Kilda by Mr. Dixon, that it might be specifically distinguished from the common Wren of this country, described it in 'The Zoologist' for 1884 (pp. 333—335) under the name *Troglodytes hirtensis*, giving at the same time a nicely engraved figure of it. The following year in 'The Ibis' (1885, pp. 69—97), Mr. Dixon referred to it in an

account which he gave of the Ornithology of St. Kilda, accompanied by a coloured plate of the supposed new Wren, and it is an uncoloured copy of that plate (although the author has omitted to say so), which forms the frontispiece to the present volume. Since then other specimens of the bird have been received from St. Kilda, and from an examination of these it is now generally admitted by ornithologists that Mr. Dresser is probably right in his opinion ('The Ibis,' 1886, p. 43), that after all *Troglodytes hirtensis* is not specifically distinct; an opinion lately echoed by Mr. Saunders in his 'Illustrated Manual of British Birds.' As none of these facts have been alluded to by Mr. Dixon in the volume now under review, it can hardly be said that his chapter on this bird places its history in a true light.

It is curious what misconception exists in the minds of most modern writers on birds whenever they take occasion to refer to Falconry. They almost invariably allude to it as a thing of the past, and (notwithstanding the information afforded by the "Falconry" columns of 'The Field'), are apparently quite unaware of the fact that hundreds of Partridges and Grouse are killed in this country every game season with trained Peregrines; that numbers of Larks are taken with Merlins; and Blackbirds and Thrushes with Sparrowhawks; and that a dozen owners of Goshawks might be named, who annually take scores of rabbits and fewer hares with their trained birds.

Mr. Dixon apparently is one of those who imagine that the art of Falconry is no longer practised in this country, judging by his remarks (p. 26), and he is equally in error when asserting (p. 28), that "Peregrines prey upon the weakly, the weary, and the unwary." Had he seen as many Grouse and Partridges killed by Peregrines as the writer of this notice, he would never have penned the lines above quoted. We are well aware that much has been written in an attempt to prove that Falcons and Hawks are "nature's police," that by killing the weakly game birds (because they are presumably the easiest to catch) they render infinite service to man by leaving only the healthiest and strongest birds to breed. This is a very pretty theory, but unfortunately for its supporters it is not true. It is undoubtedly the fact, that certain birds of prey, like the Harriers and Owls which fly low, and quarter their ground closely, carry off numbers of defenceless young birds, and old ones too occasionally, when

they find them at a disadvantage, a method not unpractised by the Sparrowhawk; but they have to take their chance of securing healthy or sickly birds as the case may be. The Peregrine, so far from selecting the youngest or weakest bird in a covey (apparently the easiest to catch), will often knock down the leader at a distance, perhaps a fine old cock bird. We have repeatedly seen a Falcon ignore a young Grouse directly under her, and stoop with success at a fast-flying bird much further away from her; the inevitable conclusion being that there is no need for such an hypothesis as that of taking the weakest, for the power of wing in a Falcon is such as to place any quarry that may be selected at a disadvantage, unless by throwing itself headlong into the heather, bracken, or other cover, as a Grouse often does, it contrives to avoid the fatal stoop.

While on the subject of Hawks, we may remark that the description given of the plumage of the Merlin (p. 32) is insufficient "to enable the young naturalist to identify" this bird, since it applies only to the adult male; and the majority of Merlins procured in this country are in the very different plumage of immaturity.

Glancing at the chapters on Game-birds, the account given of the Capercaillie (pp. 151–154) strikes us as being quite inadequate after the exhaustive treatise on this bird published by Mr. Harvie Brown,* which was reviewed in this journal in 1879 (p. 468), and of which no mention is made by Mr. Dixon. Had he referred to this source of information he would have discovered that so far from having to go back 400 years to find the Capercaillie common in the pine forests of Scotland, the date of its extinction may be fixed no longer ago than 1760, and that of its re-introduction, 1836.

In the chapter on the Red-legged Partridge (pp. 165–169) there are several statements open to criticism. "This bird," says Mr. Dixon, "is not indigenous to this country, but was introduced here like the Pheasant, so long ago that we have quite got to look upon it as a bird of the southern fields." But the two birds are not to be placed upon the same footing, for the Pheasant was introduced by the Romans, while the Red-legged Partridge was not acclimatized here until the latter half of the last century.

* 'The Capercaillie in Scotland.' By J. A. Harvie Brown. 8vo, pp. 155. Edinburgh: Douglas. 1879.

Again, we are unable to accept the statement, that "unlike the Pheasant, its immigration [a term wholly inapplicable] has not been attended with very great success." So far from this being the case, there is abundant evidence to show that from all its centres of introduction it has spread in every direction, and is now to be found in many counties to which it must have found its way unaided by man's intervention.* "It is, perhaps, fortunate," says Mr. Dixon, "that the Red-legged Partridge does not thrive very well in this country, because in all the localities in which it has established itself, the Common Partridge has sensibly decreased in numbers, and in some places has been completely exterminated by the larger and much more pugnacious species."

We do not know to what "places" Mr. Dixon refers, but having shot for many years in Norfolk, Suffolk, Essex, and Sussex, in all of which counties the Red-legged Partridge is well established, we can assure him that the view above expressed is quite contrary to our experience. We have not only found a good stock of both species occupying the same farms, but have flushed covies of both in the same field, and have known many instances of their laying in each other's nests. That there is no danger of the Grey Partridge being "completely exterminated" by the Red-legged species, may be inferred from the statistics furnished by Prof. Newton, in an article in 'The Ibis,' for 1861, p. 194.

The statement (p. 167) that "the nesting season of the Red-legged Partridge is much earlier than that of the common species, the eggs being laid by the end of April or beginning of May," is negatived by the fact that we have repeatedly seen eggs of the Grey Partridge during the first week of April, and eggs of both species, as above stated, in the same nest.

But enough of adverse criticism. Mr. Dixon's book has much in it to recommend it to the notice of all lovers of bird life; and if, here and there, there are passages which stand in need of correction, or amplification, there are many pages detailing the result of much patient observation, which will be acceptable to those who, with the same tastes as Mr Dixon, have had fewer opportunities of indulging them.

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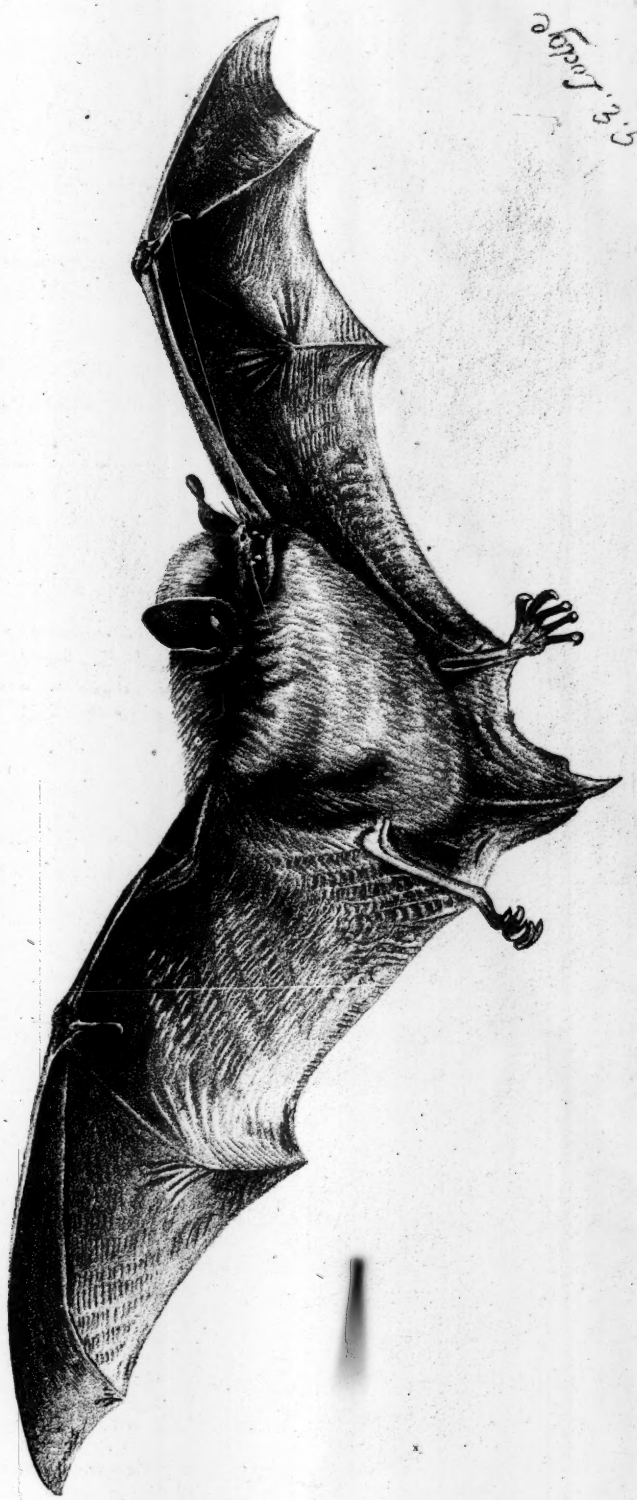
* See an article "On the Local Distribution of the Red-legged Partridge," in 'The Field,' 27th Jan. 1883.

A word of praise must be bestowed also upon the capital illustrations by Charles Whymper. Some of them, to a critical eye, may be thought a little faulty in outline, but there is no mistaking the species for which they are intended; and in most of them the drawing as well as the engraving is excellent. Amongst those which strike us as being particularly true to nature are the Oystercatcher (p. 185), and the Cormorant (p. 342), the latter of which through the courtesy of the publishers we have been permitted to reproduce.

CORMORANT AND SHAG.



Daubenton's Bat.
Vespertilio daubentonii.

J. Hutchinson, lith. West, Newman & Co. imp.